

**AMENDMENTS TO THE CLAIMS**

**Please cancel claims 39-43 without prejudice or disclaimer to the subject matter therein. Please add new claims 44-91 as follows.**

I-43 (canceled)

44.(New) A signal transmission apparatus for transmitting a first data stream and a second data stream, said signal transmission apparatus comprising:

a modulator operable to modulate the first data stream according to an m-level PSK and modulate the second data stream according to an n-level PSK to produce modulated signals;  
an inverse Fast Fourier Transformer (IFFT) operable to convert the modulated signals into an IFFT converted signal; and  
a transmitter operable to transmit the IFFT converted signal;  
wherein the first data stream has information of the value of n.

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45. (New) A signal transmission apparatus according to claim 44, wherein m is less than or equal to 4.

46. (New) A signal transmission apparatus according to claim 44, wherein n is greater than or equal to 4.

47. (New) A signal transmission apparatus according to claim 44, wherein m is less than or equal to 4 and n is greater than or equal to 4.

48. (New) A signal transmission apparatus for transmitting a first data stream and a second data stream, said signal transmission apparatus comprising:

a modulator operable to modulate the first data stream according to an m-level QAM and modulate the second data stream according to an n-level QAM to produce modulated signals;  
an inverse Fast Fourier Transformer (IFFT) operable to convert the modulated signals into an

IFFT converted signal; and

a transmitter operable to transmit the IFFT converted signal;

wherein the first data stream has information of the value of  $n$ .

49. (New) A signal transmission apparatus according to claim 48, wherein  $m$  is less than or equal to 4.

50. (New) A signal transmission apparatus according to claim 48, wherein  $n$  is greater than or equal to 4.

51. (New) A signal transmission apparatus according to claim 48, wherein  $m$  is less than or equal to 4 and  $n$  is greater than or equal to 4.

52. (New) A signal receiving apparatus comprising:

a Fast Fourier Transformer (FFT) operable to convert an input signal into an FFT converted signal;

wherein the input signal has information of a first data stream and a second data stream, the first data stream is modulated according to an  $m$ -level PSK, the second data stream is modulated according to an  $n$ -level PSK, and the first data stream has information of the value of  $n$ ; and

a demodulator operable to demodulate the FFT converted signal to produce the first data stream and the second data stream, wherein the second data stream is produced according to the information of the value of  $n$ .

53. (New) A signal receiving apparatus according to claim 52, wherein  $m$  is less than or equal to 4.

54. (New) A signal receiving apparatus according to claim 52, wherein  $n$  is greater than or equal to 4.

55. (New) A signal receiving apparatus according to claim 52, wherein  $m$  is less than or equal to 4 and  $n$  is greater than or equal to 4.

56. (New) A signal receiving apparatus comprising:

a Fast Fourier Transformer (FFT) operable to convert an input signal into an FFT converted signal;

wherein the input signal has information of a first data stream and a second data stream, the first data stream is modulated according to an  $m$ -level QAM, the second data stream is modulated according to an  $n$ -level QAM, and the first data stream has information of the value of  $n$ ; and

a demodulator operable to demodulate the FFT converted signal to produce the first data stream and the second data stream, wherein the second data stream is produced according to the information of the value of  $n$ .

57. (New) A signal receiving apparatus according to claim 56, wherein  $m$  is less than or equal to 4.

58. (New) A signal receiving apparatus according to claim 56, wherein  $n$  is greater than or equal to 4.

59. (New) A signal receiving apparatus according to claim 56, wherein  $m$  is less than or equal to 4 and  $n$  is greater than or equal to 4.

60. (New) A signal transmission system comprising a signal transmission apparatus and a signal receiving apparatus,

said signal transmission apparatus comprising:

a modulator operable to modulate a first data stream according to an  $m$ -level PSK and modulate a second data stream according to an  $n$ -level PSK to produce modulated signals, wherein the first data stream has information of the value of  $n$ ;

an inverse Fast Fourier Transformer (IFFT) operable to convert the modulated signals into an IFFT converted signal; and

a transmitter operable to transmit the IFFT converted signal;

said signal receiving apparatus comprising:

a Fast Fourier Transformer (FFT) operable to convert the transmitted IFFT converted signal into an FFT converted signal; and

a demodulator operable to demodulate the FFT converted signal to produce the first data stream and the second data stream, wherein the second data stream is produced according to the information of the value of  $n$ .

61. (New) A signal transmission system according to claim 60, wherein  $m$  is less than or equal to 4.

62. (New) A signal transmission system according to claim 60, wherein  $n$  is greater than or equal to 4.

63. (New) A signal transmission system according to claim 60, wherein  $m$  is less than or equal to 4 and  $n$  is greater than or equal to 4.

64. (New) A signal transmission system comprising a signal transmission apparatus and a signal receiving apparatus,

said signal transmission apparatus comprising:

a modulator operable to modulate a first data stream according to an  $m$ -level QAM and modulate a second data stream according to an  $n$ -level QAM to produce modulated signals, wherein the first data stream has information of the value of  $n$ ;

an inverse Fast Fourier Transformer (IFFT) operable to convert the modulated signals into an IFFT converted signal; and

a transmitter operable to transmit the IFFT converted signal;

said signal receiving apparatus comprising:

a Fast Fourier Transformer (FFT) operable to convert the transmitted IFFT converted signal into an FFT converted signal; and

a demodulator operable to demodulate the FFT converted signal to produce the first data stream and the second data stream, wherein the second data stream is produced according to the information of the value of  $n$ .

65. (New) A signal transmission system according to claim 64, wherein  $m$  is less than or equal to 4.

66. (New) A signal transmission system according to claim 64, wherein  $n$  is greater than or equal to 4.

67. (New) A signal transmission system according to claim 64, wherein  $m$  is less than or equal to 4 and  $n$  is greater than or equal to 4.

68. (New) A signal transmission method for transmitting a first data stream and a second data stream, said signal transmission method comprising:

modulating the first data stream according to an  $m$ -level PSK and modulating the second data stream according to an  $n$ -level PSK to produce modulated signals;

converting the modulated signals into an IFFT converted signal; and

transmitting the IFFT converted signal;

wherein the first data stream has information of the value of  $n$ .

69. (New) A signal transmission method according to claim 68, wherein  $m$  is less than or equal to 4.

70. (New) A signal transmission method according to claim 68, wherein  $n$  is greater than or equal to 4.

71. (New) A signal transmission method according to claim 68, wherein  $m$  is less than or equal to 4 and  $n$  is greater than or equal to 4.
72. (New) A signal transmission method for transmitting a first data stream and a second data stream, said signal transmission method comprising:
- modulating the first data stream according to an  $m$ -level QAM and modulating the second data stream according to an  $n$ -level QAM to produce modulated signals;
  - converting the modulated signals into an IFFT converted signal; and
  - transmitting the IFFT converted signal;
- wherein the first data stream has information of the value of  $n$ .
73. (New) A signal transmission method according to claim 72, wherein  $m$  is less than or equal to 4.
74. (New) A signal transmission method according to claim 72, wherein  $n$  is greater than or equal to 4.
75. (New) A signal transmission method according to claim 72, wherein  $m$  is less than or equal to 4 and  $n$  is greater than or equal to 4.
76. (New) A signal receiving method comprising:
- converting an input signal into an FFT converted signal;
  - wherein the input signal has information of a first data stream and a second data stream, the first data stream is modulated according to an  $m$ -level PSK, the second data stream is modulated according to an  $n$ -level PSK, and the first data stream has information of the value of  $n$ ; and
  - demodulating the FFT converted signal to produce the first data stream and the second data stream, wherein the second data stream is produced according to the information of the value of  $n$ .

77. (New) A signal receiving method according to claim 76, wherein  $m$  is less than or equal to 4.
78. (New) A signal receiving method according to claim 76, wherein  $n$  is greater than or equal to 4.
79. (New) A signal receiving method according to claim 76, wherein  $m$  is less than or equal to 4 and  $n$  is greater than or equal to 4.
80. (New) A signal receiving method comprising:  
converting an input signal into an FFT converted signal;  
wherein the input signal has information of a first data stream and a second data stream, the first data stream is modulated according to an  $m$ -level QAM, the second data stream is modulated according to an  $n$ -level QAM, and the first data stream has information of the value of  $n$ ; and  
demodulating the FFT converted signal to produce the first data stream and the second data stream, wherein the second data stream is produced according to the information of the value of  $n$ .
81. (New) A signal receiving method according to claim 80, wherein  $m$  is less than or equal to 4.
82. (New) A signal receiving method according to claim 80, wherein  $n$  is greater than or equal to 4.
83. (New) A signal receiving method according to claim 80, wherein  $m$  is less than or equal to 4 and  $n$  is greater than or equal to 4.
84. (New) A signal transmission and receiving method comprising a signal transmission

method and a signal receiving method,

said signal transmission method comprising:

modulating a first data stream according to an m-level PSK and modulating a second data stream according to an n-level PSK to produce modulated signals, wherein the first data stream has information of the value of n;

converting the modulated signals into an IFFT converted signal; and

transmitting the IFFT converted signal;

said signal receiving method comprising:

converting the transmitted IFFT converted signal into an FFT converted signal;

demodulating the FFT converted signal to produce the first data stream and the second data stream, wherein the second data stream is produced according to the information of the value of n.

85. (New) A signal transmission and receiving method according to claim 84, wherein m is less than or equal to 4.

86. (New) A signal transmission and receiving method according to claim 84, wherein n is greater than or equal to 4.

87. (New) A signal transmission and receiving method according to claim 84, wherein m is less than or equal to 4 and n is greater than or equal to 4.

88. (New) A signal transmission and receiving method comprising a signal transmission method and a signal receiving method,

said signal transmission method comprising:

modulating a first data stream according to an m-level QAM and modulating a second data stream according to an n-level QAM to produce modulated signals, wherein the first data stream has information of the value of n;

converting the modulated signals into an IFFT converted signal; and



transmitting the IFFT converted signal;  
said signal receiving method comprising:  
converting the transmitted IFFT converted signal into an FFT converted signal;  
demodulating the FFT converted signal to produce the first data stream and the second  
data stream, wherein the second data stream is produced according to the information of the  
value of  $n$ .

89. (New) A signal transmission and receiving method according to claim 88, wherein  $m$  is  
less than or equal to 4.

90. (New) A signal transmission and receiving method according to claim 88, wherein  $n$  is  
greater than or equal to 4.

91. (New) A signal transmission and receiving method according to claim 88, wherein  $m$  is  
less than or equal to 4 and  $n$  is greater than or equal to 4.